Cozmo Song Match User Guide

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COZMO SONG MATCH

Intro

This project with Cozmo is used to test the hearing of children aged 5-10 by giving them several song matching games. These game modes include the Tutorial Mode, Ear Training Mini-Game, and Song Match. Each of these games tests players in different ways in order to further develop their sense of hearing. The main game of this project, Song Match, is a multiplayer game that puts each user against each other and Cozmo. While the previous game is competitive, we did not want the focus to be on competition, so we implemented a tutorial mode that lets you go through a song as Cozmo assists you through it. These game modes are described further in the user guide under the Song Match, Tutorial Mode, and Ear Training Mode sections. This user guide will also describe how to set up the game and get the users started.

New

More user-friendly! Cozmo now narrates the game and interacts more with players. Now, Cozmo introduces the game, announces when the next round is beginning, says whose turn it is and when it's his turn, and says when the player has lost. This improved version now makes it clear we are playing against Cozmo, and if there are multiple players, each player will know when it's their turn and when they are out of the game. Additionally, Cozmo and the cubes are more in sync, since Cozmo now turns to the cubes when presenting each option and turns to the cube when it's tapped, acknowledging the user.
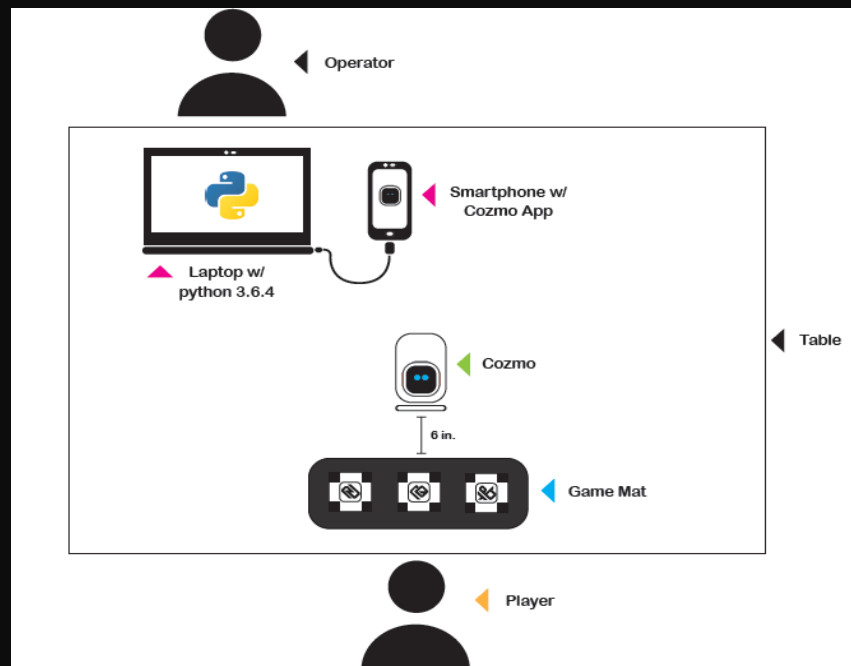
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GETTING STARTED

What is Needed to Play Song Match:

1. Cozmo Robot
2. Three Cozmo Cubes
3. A smartphone
   i. The smartphone must be an Android or iOS device
   ii. The smartphone will need the Cozmo app installed.
   iii. The smartphone will need a USB cable to connect to the computer.
4. Game Mat
   i. The Game Mat can be found and printed out at:
      https://github.com/samuelschuler/CS4500/blob/master/cube-mat.png
5. Computer
   i. For iOS devices, the computer must have usbmuxd installed:
      https://github.com/libimobiledevice/usbmuxd
   ii. For Android devices, the computer must have the Android Debug
      Bridge (adb) installed:
      http://cozmosdk.anki.com/docs/adb.html#adb
   iii. The computer will need Python 3.5.1 or later installed:
      https://www.python.org/downloads/release/python-351/

Basic Set-up

Set-up Instructions

1. Start by connecting your smartphone (or tablet) to the computer with a USB cable. The computer provided will be set-up according to instructions in the programmer's guide. The programming instructions are available at: https://github.com/samuelschuler/CS4500/blob/master/CozmoProgrammersGuide.pdf
2. Start the SDK on the smartphone. To do this, open the Cozmo app, and click "Connect" on the home page. Once the app connects to cozmo, select settings and navigate to the "SDK" section and select "Enable SDK". A black screen should appear with a big green button on the bottom of the screen. For additional information on the SDK, you can check out: https://developer.anki.com/blog/learn/tutorial/getting-started-with-the-cozmo-sdk/
3. Open a command window (Windows) or terminal (Linux/Mac) and navigate to the Song Match folder. Type the command "python3 main.py" (without quotes).
4. In front of you (the player), place the cubes on the Game Mat.
5. Place Cozmo roughly 6 inches in front of the cubes facing you (the player). If Cozmo is too close, he cannot see all the cubes and the game will not

start. Make sure that Cozmo's face isn't blocked. If his arm bar is raised, lower it. Make sure there is appropriate lighting. If the lighting is too bright, it is hard to see the color of the cubes. If it is too dark, Cozmo will not be able to see the cubes.

6. Cozmo will prompt you to pick between one of the three game modes (See game modes). It will then ask you to select between 1-3 players by turning to the corresponding cubes. Select the number of desired players. The game mode picked will begin once the number of players is selected.

GAME MODES

There are three game modes that you can choose from: Tutorial Mode, Song Match Mode, and Ear Training Mode. Each mode is unique and will be described by giving a brief introduction and the rules of the modes to help you better understand how to play each one.

Song Match Mode

Intro

The Song Match Game is the main installment of the project with the focus being on a competitive yet fun multiplayer experience. You will face up to two other players as well as Cozmo.

Rules of the Game

1. Game Start

The cubes start the game by lighting up while playing three notes of a song. The player(s) must then mimic the notes in the order that the cubes played them. After the player(s) has finished, Cozmo tries to play the same order of notes. If the player(s) or Cozmo play the correct order of notes, the cubes flash green. If the player(s) or Cozmo play a wrong note, the cubes will flash red. In following rounds, the cubes will increase the sequence by one note.

2. Player's Turn

    On each player's turn, the player must repeat the notes played by the cubes. To play a note, the current player must tap the corresponding cube. When tapped, the cube will light up and the note for that cube will play. If a player(s) repeat the sequence incorrectly three times, they will lose and be out of the game.

3. Cozmo's Turn

    On Cozmo's turn, he will try to repeat the correct sequence of notes. Cozmo plays a note by turning towards the cube and tapping his lift bar. If Cozmo repeats the sequence incorrectly three times, Cozmo will lose and is out of the game.

4. Game End

    If a player and/or Cozmo complete the entire song with less than three wrong notes, they win the game. If a player and/or Cozmo played three wrong notes, then they lost the game.

GAME MODES *CONTINUED*

Tutorial Mode

Intro

The tutorial mode is a mode where one player will go through an entire song step by step with Cozmo to understand how the game works. Cozmo will point at the cube to be tapped. In this mode, the light of this cube will flash white five times and will stay white until tapped. If the player taps the incorrect cube(s) three times, Cozmo will show them the correct sequence. It is a collaborative game.

Rules

1. Game Start
    The game starts by playing one note, and the cube corresponding to this note will flash white three times and remain white until tapped. Then, Cozmo will turn toward this cube and prompt you to tap it. The sequence then increases by one note until the song is complete. If the player gets it wrong three times Cozmo will play the sequence correctly for the player.

2. Player's Turn
    On each player's turn, the player must repeat the notes played by the cubes. To play a note, the current player must tap the corresponding cube. The correct cube will flash white five times and remain lit white until tapped. When tapped, the cube will make a sound and flash green, indicating the user tapped the correct cube.

3. Cozmo's Turn
    In this mode Cozmo will guide you along the way instead of playing against you. After the sequence is played, Cozmo will turn toward the correct cube and prompt you to 'tap this cube'. If the player repeats a sequence incorrectly three times, Cozmo will press the cubes in the correct order to demonstrate the correct sequence.

4. Game End
   The game ends when the song completes.

GAME MODES *CONTINUED*

Ear Training Mode

Intro

The ear-training mode creates a song with three randomly chosen notes. Then, song is created by randomly creating a sequence from these three chosen notes. The sequence of notes, which is the entire song, may be anywhere between 5-10 notes long. Additionally, each note in the song sequence is randomly chosen to be a whole note, half note, quarter note, or an eighth note. The goal of the game is to train players to audibly recognize notes.

Since the player will not recognize the song, they will have to rely on hearing and concentration to repeat the sequence correctly. This is intended to encourage the player to focus more on the notes and their pitches rather than the song melody.

Rules

1. Game Start
   The cubes start the game by playing three notes of the song. The player(s) must then mimic the notes in the order that the cubes played them. After the player(s) has finished, Cozmo tries to play the same order of notes. If the player(s) or Cozmo play the correct order of notes, the cubes flash green and the length of the sequence will increase by one note for the next round. If the player(s) or Cozmo play a wrong note, the cubes will flash red. The cubes will repeat the previous sequence plus the next note(s).

2. Player's Turn
   On each player's turn, the player must repeat the notes played by the cubes. To play a note, the current player must tap the corresponding cube. When tapped, the cube will light up and play the note corresponding to that cube. If the player(s) plays the wrong note three times, they are out of the game.

3. Cozmo's Turn

    On Cozmo's turn, he will try to repeat the correct sequence of notes. Cozmo plays a note by turning towards the cube and taping his lift bar. If Cozmo plays the wrong note three times, he is out of the game.

4. Game End

    If a player and/or Cozmo completes the entire song with less than 3 wrong notes, they win the game. If a player and/or Cozmo played 3 wrong notes, then they lost the game.

TROUBLESHOOTING

Problems with Cozmo

If Cozmo becomes out of alignment with the cubes, place him roughly 6 inches from the center cube, facing the last cube he played. If Cozmo becomes unresponsive, close the instance of the application and re-run the bat file to restart the game.

Problems with Cubes

If the Cubes are not detected by Cozmo, the game will not begin. Try moving Cozmo slightly further away from the cubes. If the batteries in the cubes are low, refer to the Anki Cozmo guide book to change them. Also there is a problem when touching the cubes during the game. When the cube is touched it may register twice or not at all. Currently there is no fix for this and is most likely a problem based on the cubes actually design.

Problems with the Application

If the program encountered an error and unexpectedly stops, close any instance of the program still open and re-run the application.

Additional Help

Additional information for setting up Cozmo can be found at:

http://cozmosdk.anki.com/docs/initial.html

Additional information on Cozmo can be found on Anki's website at:

https://www.anki.com/en-us/cozmo

The source code for this game can be found on Cozmo Design Studio's GitHub page:

https://github.com/samuelschuler/CS4500

Common Questions

Q: How long does Cozmo run on a single charge while playing Song Match?

A:. approximately 45 minutes.

Q: How long does it take to fully charge Cozmo?

A: Approximately 30 minutes.

Q: How do you envision an entire session with Song Match?

A: With the Operator running the app, the player plays each sequence with Cozmo following. Play time approximately 5 - 10 minutes.

Q: How is Cozmo really playing the game?

A: Cozmo turns to each cube based on the sequence. Each round, he will have a chance to make a mistake (increasing as the game goes along). His reaction is synched to whether he played correctly or not.